

08/23/01
J1042 U.S. PTO

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J1046 U.S. PTO
09/934981
08/23/01

SMALL WATERCRAFT WITH FIN AND SAIL

FIELD OF THE INVENTION

The present invention is related to a fin and/or sail propelled small watercraft. For convenience, the illustration of this invention uses a small catamaran as the model, but the invention is also applicable to a mono hull.

BACKGROUND OF THE INVENTION

This invention is an improvement of a prior invention, U.S. Patent No. 6079344. The prior invention has basically achieved its objectives. However, it is found that the elongated member of the prior invention induces a significant amount of drag in water and affects the speed of the watercraft. Another problem is that, during sailing in strong wind, its fin is not sufficient to control the watercraft moving direction, and one has to use hand to control its rudder for direction control. This invention has solved both problems.

OBJECTIVES OF THE INVENTION

The primary objective of this invention is to reduce the drag caused by the elongated member of the prior invention.

Another objective of this invention is to provide a more effective foot-controlled steering function during sailing.

A further objective of this invention is to allow the operator to easily access a lock/release mechanism to choose the foot-controlled steering function or not.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is the top view of the watercraft.

FIG. 2 is the side view of the watercraft.

FIG. 3 is the side view of the control mechanism of the watercraft.

FIG. 4 is the A-A cross-sectional view of the airfoil means and the elongated member.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 shows the top view of an improved watercraft. The watercraft has two floats [1]. A position adjustable seat [2] is installed close to the center of buoyancy of the watercraft. Multiple foot-agitated horizontal arms [3] with pedals [31] are installed in the front portion of the watercraft.

FIG. 2 shows the side view of the watercraft.

FIG. 3 shows the side view of the control mechanism of the watercraft. A vertical shaft [4] is installed in the front portion of the watercraft. The lower end of the shaft [4] is connected to one end of an elongated member [5]. At the other end of the member [5], a vertical hinge [8] is installed. A vertical fin [7] is secured to said hinge [8]. The rotation of the fin [7] about the axis of the hinge [8] is limited by stoppers [9]. The horizontal arms [3] are secured to the upper end of the shaft [4]. At the free end of each arm [3], a raised pedal [31] is installed for the operator to push the arm [3] by foot. The arms [3] turn the shaft [4], and the shaft [4] sways the elongated member [5]. When the arms [3] are pushed forward alternately, the fin [7] sways like a fishtail. The arms [3] together with the elongated member [5] can make 360-degree rotation. Depending on the direction that the elongated member [5] is generally pointing to, the fin [7] can propel the watercraft forward, backward, and make turns. A removable sail mast (not shown) can be installed right above the shaft [4]. The mast is held in place by telescoping it onto a post [10] that may be formed by the extension of the upper end of the

shaft [4]. When the sail is on, the mast does not rotate about its axis when the shaft [4] rotates. When there is not enough wind, one can use the fin [7] to propel and steer the watercraft with or without the mast on. It is shown that when the elongated member [5] points to the rear end of the watercraft, the fin [7] is located generally right below the seat [2]. This positional arrangement of the fin [7] and the seat [2] can eliminate the wiggling of the watercraft when the fin [7] sways in water. An airfoil means [11] covering the elongated member [5] can rotate about the longitudinal centerline of the portion of the elongated member [5]. When the watercraft moves and/or the elongated member [5] sways, the airfoil means [11] can turn to the direction of water flow thus to reduce the drag caused by the elongated member [5]. A lock/release mechanism for the airfoil means [11] consisting of a cantilever member [22] and a vertically rotatable pin [21] is installed on the elongated member [5]. The rotatable pin [21] is located at the free end of the cantilever member [22] and is easily accessible by the operator. When the pin [21] is down, the airfoil means [11] is locked in place and its trailing edge points to the fin [7]. In this manner, the airfoil means [11] together with the elongated member [5] become a front rudder which is controllable by feet. Because the airfoil means [11] is located closer to the front end of the watercraft than the fin [7] is during sailing, the locked airfoil means [11] thus makes the direction control more effective. A vertical fixed fin [12] installed in the rear portion of the float [1] is used to help the direction control. Nevertheless, the fin [7] can always be used to turn the watercraft around if there is a need. When the rotatable pin [21] is up, the airfoil means [11] is released for rotation.

FIG. 4 shows the A-A cross section of the airfoil means [11] and the elongated member [5] shown in FIG. 3. It also shows that the airfoil means [11] covers the elongated member [5] and the rotation of the airfoil means [11] about the longitudinal centerline of the elongated member [5].

Although this invention has been described with a certain degree of particularity, it is to be understood that the present disclosure has been made by way of example only and that numerous changes in the detailed construction may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.